OFFICE OF THE DIRECTOR
DEFENSE RESEARCH AND ENGINEERING
3040 DEFENSE PENTAGON
WASHINGTON, D.C. 20301-3040

6 February 2004

Call for FY 2005 Distributed Center Projects Proposals

The mission of the High Performance Computing Modernization Program (HPCMP) is to provide world-class commercial, high-end, high performance computing (HPC) capability to the DoD science and technology (S&T) and test and evaluation (T&E) communities. The program is organized into three major components to accomplish this mission: high performance computing resource centers, high-speed networking, and software applications support. The high performance computing resource centers include four major shared resource centers (MSRCs) supported by the HPCMP and a limited number of distributed centers (DCs) which receive partial funding from the HPCMP. MSRCs address the majority of the batch-oriented computational requirements of HPC projects and efficiently manage very large HPC systems. The S&T and T&E communities however, have HPC requirements that cannot be satisfied at the MSRCs. Recognizing that these additional requirements exist, the HPCMP awards HPC resources for distributed center projects targeted at directly meeting the project's unique computational requirements. The Services and Agencies are responsible for providing sustainment funding to support the resources; this includes annual hardware and software maintenance costs.

The High Performance Computing Modernization Program Office (HPCMPO) is soliciting FY 2005 distributed center project proposals and requests your assistance in identifying DoD service/agency organization projects with high priority but unsatisfied HPC requirements. Candidate HPC project requirements include but are not limited to real-time or near real-time applications, special operational considerations, technology investigations, or other special access needs. Based upon current budget projections, we anticipate the selection of three to five proposals. Funding, except in an unique circumstances, is targeted at $2.5M per project and must be obligated in FY 2005.

The Call for FY 2005 DoD High Performance Computing Modernization Program Distributed Center Project Proposals, Attachment 1, defines the proposal submission, evaluation, and selection process. As part of this process, I request your assistance to ensure that the appropriate organizations within your service/agency are made aware of this opportunity.

In addition, the High Performance Computing Advisory Panel (HPCAP) Principals are requested to forward those proposals having high relevance to their Service/Agency mission,

with a maximum of three proposals submitted per Service and two proposals submitted per Agency to the HPCMP for further evaluation. Any joint or inter-Service proposal will count as one from each supported Service. The due date at the HPCMPO for the prioritized proposals is 29 April 04. In a separate and later step in the process, the HPCAP Service/Agency Principals will be asked to prioritize all forwarded proposals per the procedures outlined in Attachment 2.

The HPCMP point of contact for this activity may be reached at dc-proposal-team@hpcmo.hpc.mil.

/ s /
Cray J. Henry
Director
High Performance Computing
Modernization Program

Attachments:
1. Call for FY 2005 DoD HPCMP Distributed Center Project Proposals
2. General Instructions to HPCAP Service/Agency Principals for FY 2005 DoD Distributed Center Project Proposal Packages

ATTACHMENT 1

CALL FOR FY 2005
DOD HIGH PERFORMANCE COMPUTING MODERNIZATION PROGRAM
DISTRIBUTED CENTER PROJECT PROPOSALS

INTRODUCTION

***General**:* The High Performance Computing Modernization Program (HPCMP) is soliciting service/agency relevant proposals to satisfy high priority requirements that cannot be met with its existing high performance computing (HPC) resources. Only proposals for HPC resources will be considered; proposals primarily for storage, visualization, or networking will not be considered.

The goals for distributed center projects are to support projects that generally:

(1) Require access to data or computational resources under time critical constraints that cannot tolerate network limitations and must seek local solutions rather than use MSRC resources.

(2) Require extreme security, have unconventional operating conditions, or need early access to HPC technology in ways that do not permit operating in a shared environment such as an MSRC.

***Requirements Validation**:* Organizations submitting proposals should ensure that the projects to be supported in their proposals have been entered into the HPC Modernization Program (HPCMP) Requirements Database, and that their Service/Agency has validated the projects' requirements. You are advised that the FY05 Requirements Database will close for project/user input on April 16, 2004. Accordingly, any proposed project's HPC requirements **MUST** be entered into the database on or before the April 16th date or the submitted DC project proposal for HPC resources can **NOT** be validated against stated HPC requirements. Such an event will almost assuredly result in a proposal being rejected.

Submission: Proposals must be submitted through the High Performance Computing Advisory Panel (HPCAP) Service/Agency Principals. Although DoD HPCMP distributed center project proposals are due to the HPCMP from the HPCAP Principals by 29 April, each HPCAP Principal will establish internal deadlines for submission to meet the 29 April deadline. Please contact your HPCAP Principal directly to determine their respective deadline.

The HPCMP requires that each proposal packet be submitted as one **unbound** color original, one **unbound** color copy, and one PC-based diskette, ZIP disk, or CD-ROM electronic copy. All electronic files should be in Microsoft Office 95 (or later up through 2000) formats. An electronic proposal copy should be in the form of one file. If there are multiple files, a "README.doc" file must be present in the electronic submission explaining the purpose of each file in producing a complete copy of the proposal. Questions relating to the mechanics of preparing a proposal packet can be directed to the DC Proposal Team at dc-proposal-team@hpcmo.hpc.mil.

PROPOSAL EVALUATION

Criteria: Proposals will be judged on the following criteria:

(1) DoD mission priority
(2) Military advantage gained
(3) Merit of scientific study including numerical methods
(4) Potential for significant progress gained by exploiting HPC
(5) Appropriateness of hardware solution for meeting requirements

The HPCAP Principals will prioritize proposals using criteria 1 and 2. The Technical Evaluation Panel (TEP) will evaluate the proposals using criterion 3, 4, and 5. The following provides examples of how each criterion may be applied.

DoD Mission Priority: This criterion may be represented, for example, by the Service/Agency priority for a few key weapon systems currently in the acquisition chain; the potential priority associated with new computer technology for the long-term needs of DoD; or the priority of a the project that requires extreme security measures.

Military advantage gained: This criterion encompasses the value we may gain over our adversaries through successful prosecution of the work supported by the proposed HPC equipment. Generally included here would be areas such as providing better, more timely information for a mission requirement such as precision strike. The proposal could focus on concrete advantages associated with systems under development, or on the eventual advantage that would result from application of the science associated with the proposal.

Merit of scientific study including numerical methods: This criterion focuses on the quality of the science or engineering work that will be supported on the proposed HPC equipment, as determined by the scientific or engineering community of interest. This could be focused on the engineering aspect of this factor, or focused more on advancement of computer and information technology, or unique technical or engineering results that apply.

Potential for significant progress gained by exploiting high performance computing: This criterion considers evidence of past successes in performing the type of work to be supported on the proposed HPC equipment. For example, a project being proposed for support by an organization that has an existing infrastructure for supporting real-time applications would have a better chance for progress than one that had no previous real-time experience or existing infrastructure. A project that would be supported by experts in computer and information technology, which have successfully debugged and exploited a new HPC architecture, would typically be better positioned to make progress than an organization without such a track record. A project justified on the basis of extreme security requirements should already have accredited secure facilities in place.

Appropriateness of hardware solution for meeting requirements: This criterion considers such attributes as the processor, memory, graphics, interconnection network, and storage proposed and how these match with the validated requirements of the projects to be supported in the proposal. It also considers the expected utilization of the proposed system in areas such as

appropriateness of numerical methods, use of simulation versus real military hardware, parallelization techniques, and the balance in the proposed capacities in each area. It could involve a determination of whether the storage, processor, and interconnecting network are consistent with the real-time data rate, or whether the proposed graphics system will support real-time scene generation requirements. It could include a discussion of the efficiency and effectiveness of proposed numerical methods or techniques for time critical support of man-in-the-loop and/or hardware-in-the-loop. A project evaluating new technology could be expected to propose systems that may have some risks but would have significant value if the evaluations were successfully completed. It could include consideration of the extent to which the proposal may contribute to the suitability and effectiveness of future deployments of computer technology. Another area that will be considered is the extent to which the workload justifying the HPC equipment truly requires high performance computing. Aggregation of many small projects, none of which alone requires a high performance computer, is not an appropriate use of HPC resources.

Proposals will be scored based on DoD Service/Agency priorities and technical merit. No oral briefings are required for the evaluation teams.

The Technical Evaluation Panel (TEP) will determine technical merit using criteria 3, 4, and 5. The TEP consists of representatives from the Services and DoD Agencies, members of the Computational Technology Area Advisory Panel (CTAAP), and technical experts from outside of the DoD. HPCAP Principals may participate in the TEP meetings as observers.

Should the TEP, during their technical review, require clarification of any portion of the project proposal or points of clarity to the proposal, a supplementary request will be made to the proposing project manager for a response to such questions. The original proposing site will then have seven days to provide a response forwarded for coordination back to the DC project proposal review team at the HPCMPO. Responses from all sites queried will then be forwarded to the TEP for their clarification and consideration as they complete their review. The questions raised by the TEP, if any, will be forwarded to the proposing sites on June 3rd and responses back will be due NLT June 10th. Should there be no clarifications required of a proposing site, that site will also be notified, accordingly.

Should the TEP upon completion of its technical review find the proposal technically unacceptable to the problem for which it was posed as the solution, the TEP will not amend the proposal as concerns the technical computing capability to make it a more viable solution. However, it is in the purview of the TEP to make advisories to the Director/HPCMP (the final recommendor) as to changes in sub-components, e.g. number or type of processors, amounts of memory, total disc storage capacity, etc.

DoD priorities and military advantage gained are assessed by the HPCAP Service/Agency Principals. Each HPCAP Principal will have an opportunity to review and assess all proposals including any comments from the TEP prior to the HPCAP making their collective recommendation to the Director/HPCMP.

Selection: Based on the results of the HPCAP recommendation, the TEP review and the HPCAP scoring, the Director/HPCMP will prepare recommendation(s) and forward them to the Deputy Under Secretary of Defense for Science and Technology (DUSD[S&T]) for selection.

Disbursement of Resources: HPC resources and/or funding will be released to the selected organization after receipt of a signed Terms of Reference (TOR) document in which the selected organization accepts the HPCMP's oversight requirements and agrees to fulfill the stated obligations to the HPCMP. Note that the HPCMP will in most cases utilize the buying power inherent in the TI-XY acquisition process to meet selected site's acquisition needs.

Schedule of Events—FY05 DC Selection Process:

Date	Action
6 February 2004	HPCMPO solicits FY 2005 distributed centers proposals
29 April 2004	Prioritized Distributed Centers proposals due to HPCMPO from Service/Agency principals (Services and Agencies may have earlier internal deadlines)
29 April – 05 May 2004	Review for completeness by HPCMPO
6 May 2004	HPCMPO distributes all proposals to HPCAP Principals
13 May 2004	HPCMPO distributes all proposals to TEP members
3 June 2004	Technical Evaluation Panel distributes questions (if any) for clarification to proposing sites
10 June 2004	Clarification responses from sites due to HPCMPO
22 June 2004	Technical Evaluation Panel reviews proposals
30 June 2004	TEP comments distributed to HPCAP
22 July 2004	HPCAP prioritization complete
19 August 2004	Director, HPCMP prepares recommendations for selection by DUSD(S&T)
October 2004	FY 2005 distributed centers awards announced

PROPOSAL CONTENT

Proposals are limited to 10 pages (one-sided, 8-1/2" x 11"). Supporting documents, not included in the 10 pages, are limited to: the cover sheet, staff resumes, proposed equipment lists (vendor quotes preferred), and network diagrams**.** All documents, including copies of vendor quotes, need to be in the electronic copy of the proposal. Each proposal should address all points outlined below. **The proposals will be structured such that they contain the following sections in the order given. Proposals that do not conform to this structure will be returned to the forwarding HPCAP Principal without further evaluation.**

Cover Sheet: This part of the proposal package should provide a brief description of the following:

Identifier: Project title/name of requesting site/location of requesting site/proposed location for requested HPC resources (if different).

Sponsoring Service/Agency and DoD Organization: List the Service/Agency and DoD organization sponsoring the distributed center project.

Project leader/distributed center project manager/financial manager: List the name of the project leader(s), the distributed center project manager (if any) and the financial manager to include address, telephone numbers and e-mail address for each leader(s) and manager so identified.

Technical emphasis: Describe the specific technical goals and objectives of the project to be supported by the HPC resources being requested.

Technical/engineering approach: Describe the technical/implementation approach.

Technical and computational challenges: Describe technical and computational challenges to be encountered in meeting the objectives.

Service/Agency impact: Describe Service/Agency impact of the work that will be performed through deployment and use of the HPC equipment.

Schedule: Provide key project milestones.

Keywords: Summarize keywords used in the proposal.

Body of Proposal:

Introduction*:* This section addresses key proposal requirements in broad, general terms. Include a discussion of ongoing related work in the proposing organization and the wider scientific, technology, and testing and evaluation community.

Justification/DoD Relevance: This section will be used primarily to assess the potential for military advantage of this proposed project and its Service/Agency mission priority. Clearly state the military relevance of this proposal and what current and future DoD weapons systems or programs it will support, if any. Describe how this proposal supports the science and technology or test and evaluation program of DoD and/or your laboratory or test center, respectively. Explain how the support to be provided by this proposal, combined with the military relevance, translates into a military advantage to be gained by exploiting HPC capability.

Required Resources and Justification: Justify computational resources required to satisfy the requirements in terms of total processor hours, real-time graphics requirements, real-time processing requirements, dedicated system-level testing, and other relevant measures of

quantifiable resource requirements. Include and justify memory, storage, graphics processing, networking, and software requirements. Summarize the hardware requirements in the tables below. Discuss how each requested hardware and software element of the requested total computing resource plays into the complete computing paradigm being proposed, this includes any necessary interfaces and displays and other I/O systems. Provide a short discussion addressing any possible alternative hardware configurations and include a rationale for the choices made.

DoD Distributed Center Project Hardware Requirements:

Please address the requirements for the key projects to be supported by the proposal. If it is planned to use existing equipment to satisfy part of the requirement, complete one set of tables for the total requirement and another set showing what portion will be satisfied with existing equipment. Note: Requirements shown here should be commensurate to what is provided as input to the HPCMP Requirements Database (due NLT 16 Apr 2004).

Project or Experiment	Typical Number of Processors	Maximum Number of Processors	Typical Number of Graphics Pipes	Maximum Number of Graphics Pipes	Typical Job Memory (GB)	Maximum Job Memory (GB)	Typical Job Secondary Storage (GB)	Maximum Job Secondary Storage (GB)

Project or Experiment	Typical Real -Time Data Rate	Maximum Real-Time Data Rate	Typical Real-Time Deadline	Minimum Real-Time Deadline	Typical Number of Iterations	Typical Duration of an Iteration	Equipment In the Loop (Y or N)	Man In the Loop (Y or N)

Technical Approach*:* This section will be used primarily to assess the scientific merit, potential for progress by the proposed project(s), and potential impact on mission areas supported. Ensure that computational science, computational engineering, real-time environment, and computer science aspects are discussed. Clearly state the technical goals of the project(s) to be supported and lay out a program plan for achieving those goals. Discuss project or mission area requirements to be satisfied and why the proposed HPC equipment is necessary to satisfy those requirements. These requirements may include providing computational support to existing projects. Discuss operational factors (for example, program environment, operations support, and physical infrastructure) that would make it beneficial to project users, the proposing organization, the Service/Agency, and to the DoD to perform this work at the proposed resource location. If the proposed HPC equipment is to be embedded in a larger system or environment, show the overall system level architecture. Describe the proposed architecture and how it satisfies these requirements. Discuss specifically the operational/production level status of

software to be used and numerical methods employed to satisfy the requirements, particularly the software's efficiency on the proposed system.

Provide a schedule with estimated milestones and anticipated accomplishments for HPC equipment acquisition and technical requirements to be supported by the proposed HPC equipment. Discuss technical and computational challenges to be encountered in the course of the project(s). The proposed milestones and impacts for at least the next 2 years are to be shown.

***Progress to Date*:** If this proposal is a continuation of a previously funded distributed center project, discuss the progress to date. Discuss what remains to be executed and how this additional investment will facilitate further project impact.

Resumes: Include a *resume* for each of the key personnel. Key personnel are considered to be the Project Leads for projects proposed to be supported by the HPC equipment, the Distributed Center's Manager (if any), System Administrators, and the Information Systems Security Officer (ISSO).

ATTACHMENT 2

General Instructions to the HPCAP Service/Agency Principals for FY 2005 DoD Distributed Center Project Proposal Packages

Submission of Proposals: Each HPCAP Principal should review the proposals submitted to them by proposing organizations to ensure that they support mission-critical projects that can take full advantage of a high performance computing capability. Only those proposals that meet this test should be selected and forwarded to the HPCMP. Each Service may submit no more than three such proposals and each Agency Principal no more than two proposals to the HPCMPO.

Please ensure that proposal packages have the content and structure as indicated in the attached Call for FY05 Distributed Center Project Proposals. Proposals should contain all sections as defined in the Proposal Contents section. Consistency of proposal content and format is essential to ensure fair, equitable, and consistent review. **Proposals that do not meet the content and structure requirements will be returned without further evaluation.**

Please forward the selected proposal packets to arrive no later than 4:00 P.M. Eastern Daylight Time on **Thursday, 29 April 2004** to the HPCMPO at the following address:

DoD High Performance Computing Modernization Program Office
ATTN: HPC Centers Project Manager
1010 North Glebe Road, Suite 510
Arlington, VA 22201-8205

Evaluation of Proposals for Technical Merit: The Technical Evaluation Panel (TEP) review will be conducted on or about Tuesday, 22 June, at a location to be determined. HPCAP Principals are invited to participate in the TEP review as observers.

Prioritization of Proposals: After all FY 2005 proposal packets have been received by the HPCMPO, the HPCMPO will provide an electronic copy of all previously forwarded proposals, and an electronic scoring spreadsheet to each HPCAP Principal. Upon completion of the technical review, comments by the TEP will also be forwarded to each HPCAP Principal. Each HPCAP Principal will then have the opportunity to assign a score for each of the first two proposal evaluation criteria for each proposal. These scores will take into consideration the comments as provided by the Technical Evaluation Panel. Criteria (1) and (2) will be scored from 0 to 20 points each for each proposal. The HPCAP will meet and each proposal's score on criteria (1) and (2) will then be normalized to effectively rank order the results, mitigating different scoring weights used by different evaluators. The HPCAP will then formulate a consensus ranking for the proposals and a recommendation will be forwarded by the HPCAP to the Director/HPCMPO that factors in the results of the HPCAP prioritization and the TEP comments.